

JOINT EVENT

11th International Conference on **Vascular Dementia** & **27th Euro-Global Neurologists Meeting**

July 23-25, 2018 | Moscow, Russia



Stanislav Svetlov

University of Florida, USA

Genomic biomarkers of military blast brain injury compared to mechanical impact TBI

Despite progress in understanding traumatic brain injury (TBI), the mechanisms and biomarkers of neurorepair during combat blast-induced TBI remain to be elucidated. Important question to be addressed is whether blast-induced TBI signatures are similar to those after mechanical brain injury, e.g. concussion, and what may be the differences pertinent to differential diagnostics and therapeutic enhancement of brain recovery. This includes gene expression (mRNA) and its regulation (miRNA), proteomics and its associated area of metabolomics. In this study, we compared side-by-side genomic signatures of neuro injury and neuro repair in head-directed blast overpressure exposure (OBI) vs. mechanical cortical impact (CCI) and analyzed using neurosystems biology approach presenting graphic interaction map. There was a significant difference in expression of 994 genes within blast exposure groups and in 1532 genes within CCI vs. control with an overall overlap of 579 genes. Parametric and nonparametric analyses revealed significant differences in genes of neural development and repair, between blast exposures and CCI. Specifically, brain achaete-scute complex-like 1 (ASCL1/Mash1) was up-regulated, while ROBO-1/Slit and NEDD4 were down-regulated after blast exposure and changed in opposite direction after mechanical CCI. Results show disparities as well as overlaps in the expression of genes between military and civilian type of brain injury. This will help to reveal specific biomarkers of each brain insult and assist in developing diagnostics of chronic posttraumatic encephalopathy. Novel approaches in the development of neurorepair diagnostics and enhance brain recovery will be discussed.

Recent Publications

1. Svetlov S I, Prima V, Kirk D R, Gutierrez H, et al. (2010). Morphologic and biochemical characterization of brain injury in a model of controlled blast overpressure exposure. *Journal of Trauma* 69(4)795-804
2. Svetlov S I, Larner S F, Kirk et al. (2009) Biomarkers of Blast-Induced Neurotrauma: Profiling Molecular and Cellular Mechanisms of Blast Brain Injury. *J. Neurotrauma* 26 1-9
3. Svetlov S I, Prima V, Glushakova O, et al (2012) Biomarkers of Neuroglial Injury in Models of Combat TBI: Primary Blast Over-Pressure Compared to Composite Blast. *Biomarkers For Traumatic Brain Injury*. Royal Society of Chemistry 122-133.
4. Agoston D V and Elsayed M (2012) Serum-based protein biomarkers in blast-induced traumatic brain injury spectrum disorder. *Front Neurol*. 3 107.
5. Svetlov S I, Prima V, Zhang Z et al. (2015) Acute and Subacute Differential Gene Expression in Rat Midbrain Following Blast Exposure Compared to Mechanical Brain Trauma. *J Neurol Neurobiol*. ISSN 2379-7150.

Biography

Stanislav Svetlov has expertise and international recognition for studies in Traumatic Brain Injury (TBI), especially combat-related blast TBI proven by a number of publications and awards from Department of Defense on molecular signatures and biomarkers of blast brain injury and US patents. His goal is to determine and characterize biomarkers reflecting chronic encephalopathy, including neuroinflammation and impaired neurogenesis and repair. He is a Chief Scientific Officer at Immunova LLC, a biopharmaceutical company and Adjunct Researcher and Associate Professor at University of Florida, USA in Medicine and Psychiatry.

ssvetlov@ufl.edu